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# (12) United States Patent

### Aamer et al.

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# (54) HYDROPHILICALLY MODIFIED FLUORINATED MEMBRANE (I)

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CPC ....... *B01D 71/44* (2013.01); *B01D 67/0006* (2013.01); *B01D 67/0088* (2013.01);

(Continued)

(58) Field of Classification Search

None

See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

4,136,237 A 1/1979 Takahashi et al. 4,975,507 A 12/1990 Asrar

(Continued)

#### FOREIGN PATENT DOCUMENTS

CN 101490126 A 7/2009 CN 103415335 A 11/2013

(Continued)

## OTHER PUBLICATIONS

European Patent Office, Extended European Search Report issued in European Application No. 15196329.5, 5 pp. (Sep. 5, 2016).

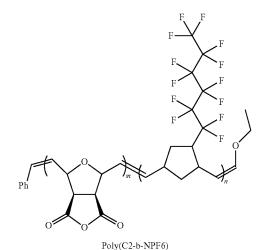
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# (57) **ABSTRACT**

Disclosed are polymers suitable for hydrophilically modifying the surface of porous fluoropolymer supports, for example, a copolymer of the formula:



Also disclosed are a method of preparing the polymers, a method of hydrophilically modifying porous fluoropolymer (Continued)

